

Claims

[c1] 1. A modular gravity-advance roller conveyor for conveying articles down an inclined path, the conveyor comprising:

- a mat including:
 - a plurality of rows of one or more modules,
 - each row extending longitudinally from a first end to a second end, transversely from a left side to a right side, and in thickness from a top surface to a bottom surface,
 - each row including linked connecting elements along the first end and the second end connecting consecutive rows together end to end to form the mat extending longitudinally from an entrance end to an exit end,
 - at least some of the rows including rollers extending above the top surface of the row;
- a conveyor frame including an inclined base supporting the mat with the entrance end of the mat positioned at a higher elevation on the inclined base than the exit end of the mat;
- whereby the weight of articles introduced onto the

mat causes the rollers in contact with the articles to rotate and move the articles down the mat.

- [c2] 2. A conveyor as in claim 1 further including connecting pins extending transversely through the connecting elements to link the connecting elements of consecutive rows together.
- [c3] 3. A conveyor as in claim 1 wherein at least some of the rollers are arranged to rotate about transverse axes.
- [c4] 4. A conveyor as in claim 1 wherein at least some of the rollers are arranged to rotate about oblique axes.
- [c5] 5. A conveyor as in claim 1 wherein at least some of the rollers are universally rotatable roller balls.
- [c6] 6. A conveyor as in claim 1 wherein at least some of the rollers are cylindrical rollers rotating on axles.
- [c7] 7. A conveyor as in claim 1 wherein the rollers include first rollers arranged to rotate about first axes parallel to a first direction and second rollers arranged to rotate about second axes parallel to a second direction and wherein the mat is divided transversely into first and second longitudinal lanes wherein the first longitudinal lane includes only first rollers and the second longitudinal lane includes only second rollers.

- [c8] 8. A conveyor as in claim 7 wherein the first direction is the transverse direction and the second direction is oblique to the transverse direction.
- [c9] 9. A conveyor as in claim 7 wherein the first direction and the second direction are oblique and are mirror images of each other about the longitudinal centerline of the mat.
- [c10] 10. A conveyor as in claim 1 wherein the mat is divided transversely into a right-side lane, a center lane, and a left-side lane and wherein rollers in the right-side lane are arranged to rotate about axes directing articles toward the center lane and wherein rollers in the left-side lane are arranged to rotate about axes directing articles toward the center lane.
- [c11] 11. A conveyor as in claim 10 wherein rollers in the center lane are arranged to direct articles longitudinally down the center lane.
- [c12] 12. A conveyor as in claim 1 wherein the mat is divided longitudinally into an upper portion and a lower portion and wherein rollers in the upper portion are arranged to rotate about axes parallel to a first direction and wherein rollers in the lower portion are arranged to rotate about axes parallel to a second direction.

- [c13] 13. A conveyor as in claim 12 wherein the second direction is the transverse direction and the first direction is oblique to the transverse direction.
- [c14] 14. A conveyor as in claim 1 wherein the rollers in the mat are arranged in longitudinal lanes and extend beyond the bottom surface of the mat and wherein the inclined base includes a plurality of transversely spaced longitudinal support strips positioned between the longitudinal lanes of rollers on the mat.
- [c15] 15. A modular gravity roller conveyor for conveying articles down an inclined path, the conveyor comprising:
 - a conveyor frame including an inclined base;
 - a length of modular plastic roller-top conveyor belt supported stationarily on the inclined base and extending longitudinally from an upper end to a lower end and transversely from a left side to a right side.
- [c16] 16. A conveyor as in claim 15 wherein the modular plastic roller-top conveyor belt includes first rollers arranged to rotate about first axes parallel to a first direction and second rollers arranged to rotate about second axes parallel to a second direction and wherein the belt is divided transversely into first and second longitudinal lanes wherein the first longitudinal lane includes only first

rollers and the second longitudinal lane includes only second rollers.

- [c17] 17. A conveyor as in claim 16 wherein the first direction is the transverse direction and the second direction is oblique to the transverse direction.
- [c18] 18. A conveyor as in claim 15 wherein the modular plastic roller-top conveyor belt is divided transversely into a right-side lane, a center lane, and a left-side lane and wherein rollers in the right-side lane are arranged to rotate about axes directing articles toward the center lane and wherein rollers in the left-side lane are arranged to rotate about axes directing articles toward the center lane.
- [c19] 19. A conveyor as in claim 18 wherein rollers in the center lane are arranged to direct articles longitudinally down the center lane.
- [c20] 20. A conveyor as in claim 15 wherein the modular plastic roller-top conveyor belt is divided longitudinally into an upper portion and a lower portion and wherein rollers in the upper portion are arranged to rotate about axes parallel to a first direction and wherein rollers in the lower portion are arranged to rotate about axes parallel to a second direction.

[c21] 21. A conveyor as in claim 20 wherein the second direction is the transverse direction and the first direction is oblique to the transverse direction.

[c22] 22. A method for constructing a gravity conveyor, the method comprising:
providing a conveyor frame with an inclined base;
supporting a length of modular roller-top conveyor belt stationarily on the inclined base of the conveyor frame.

[c23] 23. A modular gravity-advance roller conveyor for conveying articles down an inclined path, the conveyor comprising:
a stationary mat including:
a plurality of modules linked together in rows to form the mat,
at least some of the modules including rollers extending above the top surface of the mat;
a conveyor frame including an inclined base supporting the mat between a higher end and a lower end;
whereby the weight of articles introduced onto the mat causes the rollers in contact with the articles to rotate and move the articles toward the lower end of the mat.

- [c24] 24. A conveyor as in claim 23 wherein at least some of the rollers are universally rotatable roller balls.
- [c25] 25. A conveyor as in claim 23 wherein at least some of the rollers are cylindrical rollers rotating on axles.
- [c26] 26. A conveyor as in claim 23 wherein the mat is divided into a right-side lane, a center lane, and a left-side lane and wherein rollers in the right-side lane are arranged to rotate about axes directing articles toward the center lane and wherein rollers in the left-side lane are arranged to rotate about axes directing articles toward the center lane as the articles move toward the lower end of the mat.
- [c27] 27. A conveyor as in claim 26 wherein rollers in the center lane are arranged to direct articles down the center lane as the articles move toward the lower end of the mat.